

AMENDMENTS TO THE DRAWINGS

Reference numbers in Figure 2 are amended to conform to the description in the patent application.

Attachment: Replacement Sheet(s)

REMARKS/ARGUMENTS

In response to the Office Action mailed April 9, 2007, Applicant amends his application and requests reconsideration. No claims are added or cancelled in this Amendment so that claims 1-6 remain pending.

Claims 2 and 5 were stated to be allowable if rewritten in independent form.

There was an extensive objection to the specification. Rather than attempting to respond to each of the points raised by the Examiner, the foregoing amendment to the specification responds, as necessary, to these points.

The point raised with respect to page 10, lines 21 and 22 requires no change. There was no inconsistency between the passage appearing there and the passage appearing at page 8, lines 19 and 20. The passage at page 8 merely points out that the AC-DC converters 510-540 are separately and independently connected to different array transformers so that the converters can have different characteristics. Thus, those converters might produce the same or different output voltages since their respective internal constructions can be substantially different.

Page 10 merely describes determining the number of stages, each stage including a converter, by dividing the power rating of the transformer 200 of Figure 1 by the power rating of each array transformer. There is an implied assumption that each array transformer has the same power rating. However, that power rating has nothing to do with the output voltage of the converter unit since, assuming no power factor, it is fundamental in electrical engineering that the power rating is the product of a voltage and a current. The voltage and current can vary while maintaining a constant product of those variables. Thus, the only change made in response to this comment is the insertion of parenthesis at one location at page 10 in order to avoid a potential misinterpretation that would not be made by one of skill in the art. It seems readily apparent that the number of stages referred to at that page is likewise apparent to that person of ordinary skill.

The other changes made in the specification, mostly related to minor translational issues, should remove the lack of clarity identified by the Examiner.

The drawings were objected to. Most of these objections are respectfully traversed.

Figures 1, 2, and 6-8 were objected to as showing elements having an electrical connection that is “floating”. This depiction is entirely conventional and does not provide any basis for objection to the drawings. What is claimed in the patent application is shown in the drawings. Persons of ordinary skill in the art understand that what is shown is part of larger network that is not claimed, that cannot be completely depicted, and that plays no role in disclosing the claimed invention. Moreover, parts of the drawings are drawn so that they are non-limiting. For example, in Figure 1, four array transformers 410-440 are illustrated but there is no reason why the invention is limited to four such transformers. There may be fewer or more such transformers and that understanding is conveyed by the “floating” connection to the switch 342 shown at the bottom of Figure 1.

Likewise, the lines 1 and 2 that are connected to the primary winding 201 of the transformer 200 are floating because they are connected to a larger network, for example a power distribution system, and it is conventional, as shown by two of the patents cited in the Office Action (Paulsson, see Figures 1, 2, and 3b and Warrington, see Figure 2) as well as Figures 1, 3, and 4 of the principal reference applied in the prior art rejection and discussed below.

While the switch 300 is mentioned within the patent application, it is not part of the claimed subject matter. Persons of skill in the art understand the operation of that switch. Accordingly, no change in any figure is required in response to the comment concerning “floating” lines.

The drawings were objected to as including reference numbers not appearing in the specification. With respect to the 300 and 400 series numbers appearing in Figure 2, Figure 2 is amended. The corrected reference numbers are identical to those used in Figure 1. The patent application expressly describes that common reference

numbers are used for identical elements. With respect to the 900 series numbers of Figure 3, the Examiner will find these reference numbers used in the specification as filed at page 13 in lines 7-20, the description of Figure 3.

Claims 1, 2, and 5 were objected to with respect to specific language. The suggestion with respect to claim 1 is not adopted because it does not represent a grammatical improvement. The suggestions for claims 2 and 5 are adopted.

Claims 1, 3, 4, and 6 were rejected as unpatentable over Senda (JP 10-28319)¹, in view of Stoupis et al. (U.S. Patent 7,154,722, hereinafter Stoupis) and further in view of Wilson (U.S. Patent 5,206,775). This rejection is respectfully traversed.

In order to establish *prima facie* obviousness of any claim, it is fundamental that the publications applied, together, must include all of the claim limitations. Of course, a demonstration that all of the elements of claimed invention are known in the prior art is, by itself, insufficient to establish obviousness. *KSR International Co. v. Teleflex, Inc.* 550 U.S. _____ (2007).

According to the characterization of Senda, that publication describes a series transformer 3, multiple array transformers 6 having primary windings that are connected in series, a plurality of AC-DC converter units 7, and a plurality of independent DC circuits 8 respectively connected to the DC side of a respective converter unit. The language relating to the DC circuits in claims 1 and 4 has been amended for clarity. Both claims have always described a plurality of such DC circuits because of the use of the word “circuits” as the fourth word of the final paragraph of examined claim 1 and the penultimate paragraph of examined claim 4. Further, comparison of the claims to the embodiments of Figures 1 and 4 of the patent application, encompassed by those claims 1 and 4, reveals the clear meaning of the claims, even as examined.

It is apparent upon inspecting Figures 1, 3, and 4 of Senda that the structure of the primary windings of the transformers 6 is not disclosed. All that is disclosed in

¹ The first inventor's family name is Senda, the name used here. The first inventor's given name is Takuji, the name used in the Office Action.

the figures is that the primary windings apparently have a wye form and the secondary windings have a delta form. How the primary windings are interconnected to each other is not disclosed by those figures. In addition, there seems to be a single capacitor 8, considered by the Examiner to correspond to the “mutually independent DC circuits” of the pending claims. Clearly, that single capacitor cannot meet the claim limitation.

The foregoing explanation of Senda is based upon the Examiner’s interpretation of what is disclosed in the principal figures of Senda, an interpretation that is not unreasonable if one does not consider the content of Senda. For the Examiner’s benefit, a computer-generated English language translation of Senda from the JPO website is attached. That translation shows that element 9 is a source of DC power, such as a fuel cell or solar battery supplying power to the single capacitor 8.

The single capacitor 8 of Senda is not the same, with or without the fuel cell or solar cell, as the mutually independent DC circuits of claims 1 and 4. The reason for those independent DC circuits are present, as brought out in the patent application, is redundancy and fault protection. Each DC circuit can be isolated in the event of a local fault while the remaining DC circuits and associated array transformers continue to function. Senda’s single capacitor and power source 9 cannot produce that function, structure, or advantage.

Thus, *prima facie* obviousness cannot be established with respect to claims 1, 3, 4, and 6 unless the elements of these claims that are missing from Senda are supplied by Stoupis and/or Wilson. (Applicant further notes that there is no assertion that the pairs of normally-on switches and normally-off current bypass devices of claims 1 and 4 are disclosed by Senda.)

Stoupis was cited with respect to providing an arrangement for isolating, via normally-on switches, a faulty section of a transmission line. Based upon the reference numbers mentioned at page 6 of the Office Action, the Examiner was apparently directing attention to Figure 3C of Stoupis. The Examiner pointed out that the section of the distribution line 318 that is isolated is connected between two fault

interrupters, normally-on switches, 302 and 303. The difficulty with comparison of that figure of Stoupis, and the other figures of Stoupis, with the claimed invention is that in the claimed invention each of the primary windings of each of the array transformers has a respective pair of normally-on switches. No such arrangement is described by Stoupis.

To be sure, the transformers 305 and 308, respectively connected to the loads 313 and 315 in Stoupis, have respective pairs of normally-on switches. However, transformers 301 and 306 lack those switches. Those transformers 301 and 306 include only a single such normally-on switch. Further, as acknowledged in the Office Action, there are no normally-off current bypass devices for respective transformers in Stoupis.

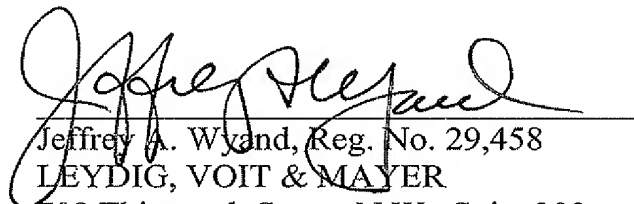
As a result of these differences between claims 1 and 4 and Stoupis, it is impossible for Stoupis to isolate respective transformers that may have a fault or may be connected to a fault, while maintaining in service the remaining transformers, as in the invention. For example, it is apparent in Figure 3C of Stoupis that the arrangement provided, including the redundant distribution line 319, ensures that with the fault arrangement shown, loads 315 and 312 continue to receive power. On the other hand, load 314, which is not connected to any faulty distribution line, is unnecessarily isolated. Accordingly, Stoupis does not stand for the proposition for which it was cited, namely as supplying respective pairs of normally-on switches for corresponding primary windings of the array transformers. Further, as acknowledged in the Office Action, Stoupis cannot provide the bypass functionality of the invention, isolating one array transformer without electrically isolating another array transformer.

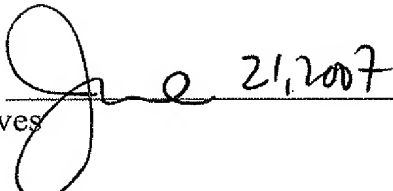
Wilson was cited as describing a circuit bypass device, namely a normally-off switch equivalent "connected in series with a circuit". Of course, the language of the independent claims concerning normally-off current bypass devices describes those devices as connected in parallel with corresponding combinations of the primary winding of a corresponding array transformer and its associated pair or normally-on

switches. Wilson is directed to a single bypass device connected in parallel with a battery cell. Even assuming Wilson stands for the proposition for which it was cited, and might be used to modify further the modification of Senda with Stoupis as proposed in the Office Action, there would still be numerous elements of the independent claims 1 and 4 missing from the combination of prior art publications. Those missing elements are the respective pairs of normally-on switches provided for each of the primary windings of the plurality of array transformers and the plurality of mutually independent DC circuits.

Accordingly, the more basic of two required tests for establishing *prima facie* obviousness have not been met with respect to any of the rejected claims by the publications applied. Therefore, upon reconsideration, claims 1, 3, 4, and 6 should be allowed along with dependent claims 2 and 5, which were previously indicated to be allowable.

Respectfully submitted,


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